NOAA 'BOUT WEATHER

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Summer 2010 Climate Summary

The 2010 summer months were characterized by above normal temperatures and near normal rainfall. Roanoke, Danville, Blacksburg, and Bluefield all had their warmest summers on record. When averaging all available temperature data from across the states, both Virginia and North Carolina experienced their warmest ever summer, with West Virginia seeing its second warmest. Both the average high and low temperatures were significantly above normal, with this summer featuring many individual day record temperatures. The summer featured prolonged periods of dry weather, with most of the rain coming in short periods of time. It was a busy couple of months for severe weather as well, with over 500 reports of wind damage and hail across the Blacksburg County Warning Area.

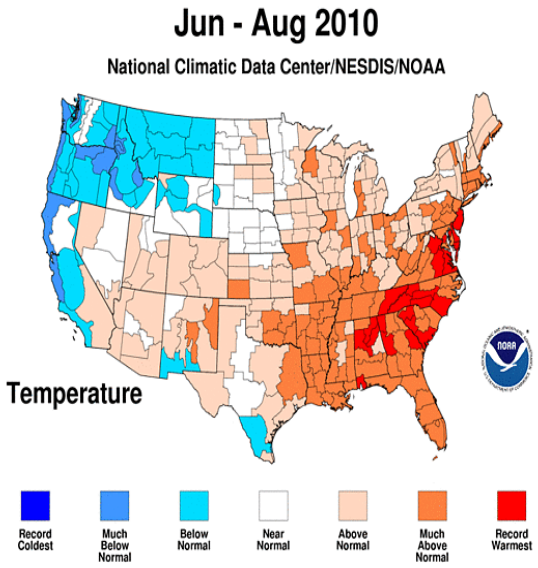


Figure 1: Summer Temperature Anomalies

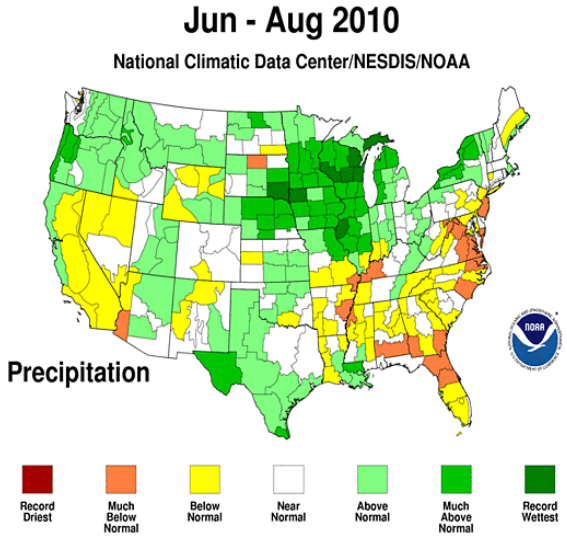
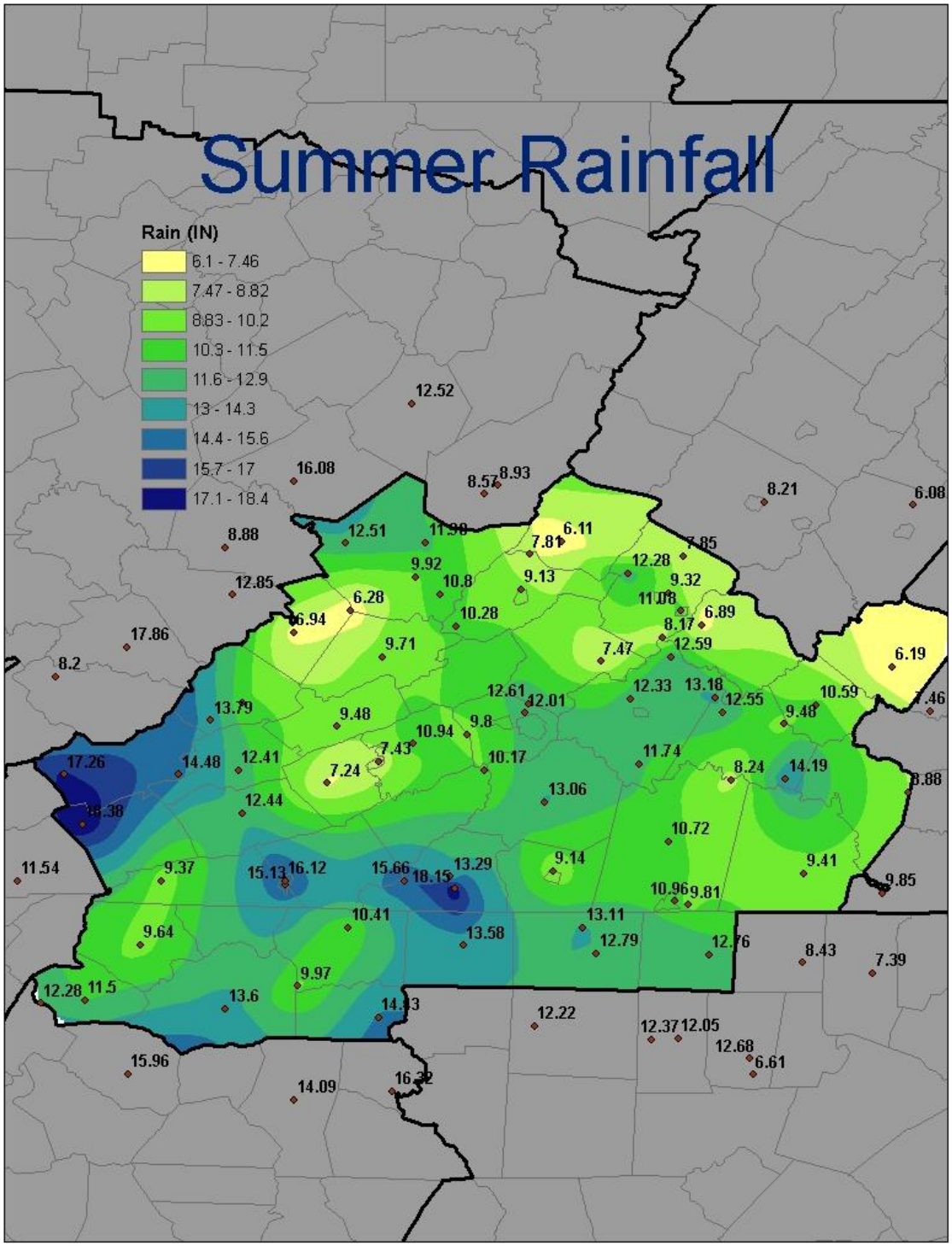


Figure 2: Summer Precipitation Anomalies

Total Summer Rainfall



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June 2010

The predominant weather pattern during June was for an upper level ridge of high pressure to settle over the southeastern part of the country. This brought above normal temperatures to the area with almost every day of the month averaging above normal. This type of pattern also prevented many strong cold fronts from passing through the area. Most fronts remained to our north and weakened as they approached the region. This allowed for warm and humid conditions to persist through the month. Most of our rain came from scattered showers and thunderstorms and weakening thunderstorm complexes, which were most common across far western Virginia and southeast West Virginia. Thus, many areas east of the Blue Ridge became dry and began to enter into minor drought conditions. All parts of the County Warning Area received some severe weather reports, as it was a busy month for severe thunderstorms. Over 80 severe thunderstorm or tornado warnings were issued, with over 200 instances of wind damage or hail reported.

July 2010

July started out with a large area of high pressure overhead bringing dry conditions and increasing heat to the area. By the 8th, the humidity began to increase and persisted for much of the remainder of the month. Once again upper level high pressure overhead prevented many strong fronts from pushing through with cooler and drier air. Thus, it remained well above normal temperature and humidity wise across the region. Most of our rain came from scattered showers and thunderstorms as weak cold fronts approached our humid air mass. Therefore, rainfall amounts were very variable across our region, but most locations were below normal by month's end. This lack of significant rainfall and extreme heat pushed parts of the piedmont into a moderate drought by the end of the month. It was another fairly active month with regards to severe weather, with 70 warnings issued and over 120 reports of storm damage. The highest concentration of severe thunderstorms was over the piedmont, with only a few west of the Blue Ridge.

August 2010

August was a wet and hot month across our region as an upper level ridge of high pressure remained predominately over the southeastern United States. Humidity levels remained high for much of the month, as only a few cold fronts made it this far south. Most of our rain once again came from scattered showers and thunderstorms. However, a stalled weak front became the focus for more widespread heavier showers and thunderstorms around mid-month. A large area of high pressure then brought dry weather to end August. However, the rain that fell early and mid month was enough to improve drought conditions across much of southwest Virginia. August was another busy severe weather month with 70 warnings issued, and over 180 reports of storm damage. Severe thunderstorms were more evenly distributed in August than in July, with all portions of the CWA experiencing strong thunderstorms.

A more detailed climate summary with graphs and charts exists here.

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Winter Outlook for the Area

After the snowy winter of 2009-2010 many people in our area may be wondering what the winter of 2010-2011 has in store for the Blacksburg/Roanoke County Warning Area (CWA). The Climate Prediction Center (CPC) of the National Weather Service (http://www.cpc.ncep.noaa.gov/) is responsible for producing the longer-range forecasts out to a range of one year for the entire U.S. Every month the CPC updates these forecasts using a variety of predictive tools to make scientifically sound forecasts on precipitation and temperature.

Before discussing the actual forecast, it may help to understand what factors are considered in making these forecasts. The main tools are: 1) Computer models of the earth-atmosphere system; 2) Statistical analysis of existing and forecast meteorological patterns; 3) State of the El Niño/Southern Oscillation (ENSO); 4) Trends in climate normals; 5) Soil moisture analogs; 6) Single-station statistical methods. Various predictive tools may have more or less skill at different seasons or locations in the U.S. and depending on the strength of a particular signal.

For wintertime in the southern Appalachian/mid-Atlantic region, which our CWA falls into, the most accurate long-range forecasts tend to be those driven by a strong ENSO signal, whether that is El Niño or La Niña. The winter of 2009-2010 was dominated by a strong El Niño event with warm Pacific Ocean temperature anomalies reaching +1.8^{o}C (using the Oceanic Niño Index or ONI) in the November-January time frame. This was the strongest El Niño since the record-setting 1997-1998 (+2.5^{o}C) event. The past six- month period however has seen some of the most dramatic changes in the equatorial Pacific Ocean heat content since these types of records have been kept (essentially since the early 1950s). Beginning in April and accelerating through May the oceanic heat content has completely reversed itself and as of mid-October a fairly strong La Niña has developed). The ONI as of mid-October (July-September average) has fallen to -1.0^{o}C, with the threshold for a La Niña of -0.5^{o}C. For this to qualify as a full-blown La Niña this temperature anomaly will have to persist for 5 consecutive overlapping seasons. By another measure called the Southern Oscillation Index (SOI), this La Niña is already quite strong. According to the Australian Bureau of Meteorology, the SOI value of +25 for September is the strongest since 1973 and this value puts it in the top 5% of observed SOI values. However, it is quite unusual to transition from a strong El Niño to a strong La Niña within one season and the effects on our weather of this rapid transition are uncertain.

So with a La Niña event already well entrenched and nearly all forecast models from around the world predicting its perseverance into the spring of 2011, what impact can we expect on the local weather this winter? According to the latest Climate Prediction Center (CPC) forecast, issued on October 21 somewhat warmer temperatures are likely across the southern one-half of the United States in the December-February period

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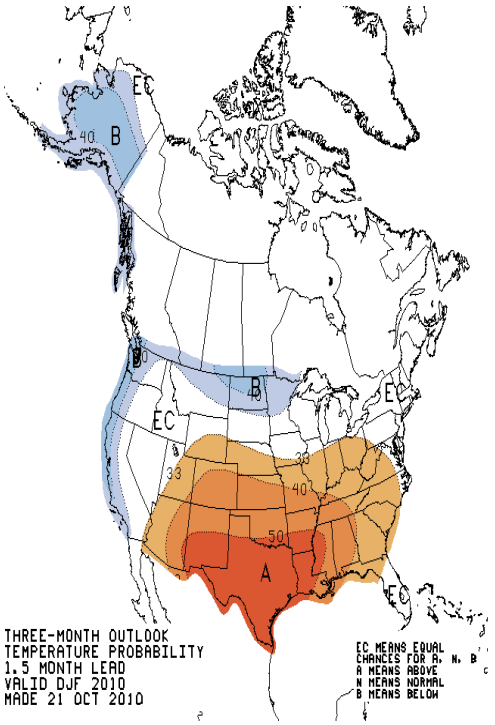
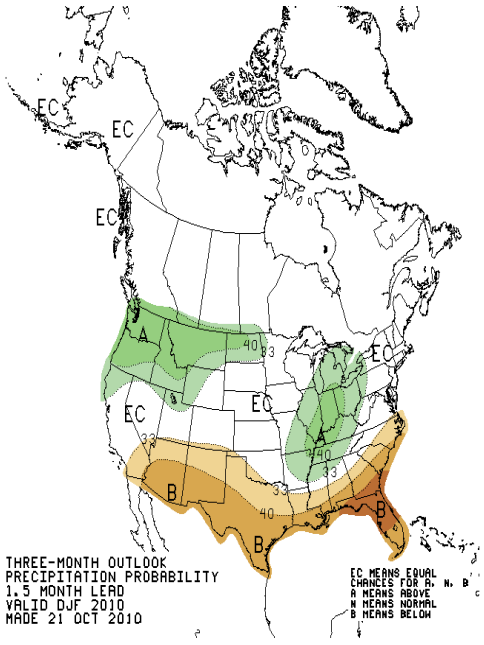


December-February U.S. Temperature forecast

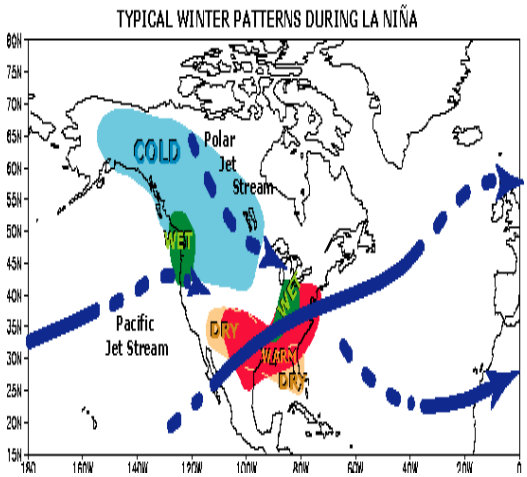
The above normal area covers most of the southern and central U.S. with the greatest likelihood of above normal temperatures over the southwestern U.S. from New Mexico eastward into Mississippi. In this area the '50' line indicates a 50 percent chance or greater that the average temperature over the 3-month period will be in the above normal tercile of temperature. A tercile represents one-third of the values in the climatological record period (1971-2000). For statistical purposes, this temperature record can be divided into 3 equal terciles; above, normal and below. For the Blacksburg CWA then, the forecast is for slightly above a 33 percent chance (roughly 35-38 percent) of the average temperatures for the entire winter season falling into the highest tercile. The precipitation forecast is even more uncertain, with the entire area falling within the "Equal Chances" (EC) tercile.



December-February U.S. Precipitation forecast

The figure below shows a schematic how a typical La Niña winter affects North America. The higher precipitation over the Ohio Valley is usually due to a more active storm track across that region. Reduced precipitation along the southeastern U.S. coast is due to fewer low pressure centers developing over the Gulf of Mexico and tracking toward the Carolina coastline. One only has to go back to the winter of 2007-2008 for a possible analog (similar season and pattern) to what we may expect this coming winter. That winter a fairly strong (-1.4^{o}C ONI) La Niña was in place and overall winter temperature were well above normal, running generally 2 to 4 degrees (F) above the 30-year mean. For several of our local climate stations the winter ranked in the top 10 warmest on record and was the warmest yet recorded at Bluefield, WV. The predominant storm track was across the Ohio Valley bringing above normal precipitation to that area and warmer

temperatures along the southeast U.S. coast extending back into the Appalachian Mountains. It remains to be seen whether the current La Niña will reach the same strength as the 2007-2008 version, which could have an impact on how things develop this winter. However, a local office study recently conducted looking at fairly strong La Niña winters immediately following El Niño summers (similar to this year) suggested a very good chance for above normal temperatures in the December-February time frame. The warmest month relative to normal was January with a tendency for cooler temperatures to occur later in the winter season (February). Precipitation under these types of scenarios was below normal but highest in our western CWA closer to the dominant Ohio Valley storm track.



Typical North American Winter Patterns during La Niña.

So the big question for local winter weather lovers (and haters!) is how much snow will we get this winter?

The average annual snowfall in inches for the five climate observing sites in our CWA is as follows, along with last year's amount in parentheses:

- Lynchburg - 15.3 (34.8)
- Roanoke - 21.3 (43.1)
- Blacksburg - 22.5 (53.6)
- Bluefield - 32.0 (81.1)
- Danville - 9.2 (13.4)

During the La Niña winter of 2007-2008 discussed above however, snowfall ranged from only 2.1 inches (Lynchburg) to 14.0 inches (Bluefield) with the other stations falling somewhere in between. So, one could reasonably forecast that our snowfall numbers for this coming winter will be much closer to the 2007-2008 values than the extraordinary numbers reached in 2009-2010. Although snowfall is likely to be below normal, the possibility for significant ice storms may actually be enhanced somewhat by this expected pattern with more opportunities for cold-air damming scenarios.

One of the biggest impacts of the La Niña winter of 2007-2008 was the increased fire danger due to the combination of below normal precipitation, especially low snowfall, and above normal temperatures. The February 10, 2008 wildfire was one of the largest recent wildfire outbreaks in Virginia coming at the tail end of the warm and almost snowless La Niña winter of that year. Because of these same factors being in place, the National Fire Interagency Coordination Center in Boise, ID is suggesting that there is an above normal chance for significant wildfires across our entire region.

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FOUR COMMUNITIES DECLEARED STORMREADY IN 2010

by Phil Hysell

Many communities in the Blacksburg forecast area have submitted applications to become "StormReady".
In 2010, the National Weather Service in Blacksburg certified four new StormReady communities.

In January, the most populated city in our forecast area, Roanoke, officially became StormReady. Also added to the list of StormReady Communities this year were Virginia Tech, which was the first University in Virginia to become StormReady, as well as Buckingham County, VA and Rockingham County, NC.

StormReady Communities have established a way to better protect citizens from severe weather threats.

StormReady is a program aimed at preparing communities across the nation with the communication and safety tools necessary to save lives and property. In a nutshell, StormReady establishes an industry standard for severe weather preparedness and communication.

The nationwide community preparedness program uses a grassroots approach to help communities develop plans to handle local severe weather and flooding threats. The program is voluntary and provides communities with clear-cut advice from a partnership between local National Weather Service forecast offices and state and local emergency managers.

StormReady started in 1999 with seven communities in the Tulsa, Oklahoma area. There are now more than 1,500 StormReady communities across the country, with 10 residing in the Blacksburg forecast area.

To be recognized as StormReady, a community must:

- Establish a 24-hour warning point and emergency operations center;
- Have more than one way to receive severe weather forecasts and warnings and to alert the public;
- Create a system that monitors local weather conditions;
- Promote the importance of public readiness through community seminars;
- Develop a formal hazardous weather plan, which includes training severe weather spotters and holding emergency exercises.

The StormReady recognition will be in effect for three years when the communities will go through a renewal process.

Just like communities, families need to be storm ready by having an action plan for severe weather.

For more information about StormReady visit: http://www.stormready.noaa.gov

A New NOAA "All-Hazards" Weather Radio Station is on the Air

by Phil Hysell

NOAA 'BOUT WEATHER

If you live in the Mountain Empire region of southwest Virginia and have heard about the life-saving benefits of NOAA "All-Hazards" Weather Radio (NWR), but have had difficulty receiving a clear signal, we have some great news. Thanks to a grant from the USDA, a NWR transmitter has been placed on Sand Mountain near Wytheville and is broadcasting on a frequency of
162.450 MHz.

NWR broadcasts National Weather Service warnings, watches, forecasts and other hazard information 24 hours a day. Known as the "voice of the National Weather Service," NWR is provided as a public service by the Department of Commerce's National Oceanic and Atmospheric Administration.

Battery powered weather radios equipped with a special alarm tone feature can sound an alert and give you immediate information about a life-threatening situation. During an emergency, NWS forecasters will send out a special tone to activate weather radios in the listening area. This is especially valuable at night, or when the power is out.

With new digital technology, called Specific Area Message Encoding (SAME) broadcast on NWR are now be targeted to a specific area, such as a county or portion of a state, to bring more hazard-specific information to the listening area. This means you can specify what counties you want alerted on your weather radio. It's like having your own personal tornado siren!
With the holiday season fast approaching, a NOAA "All-Hazards" Weather Radio makes a great gift, and they save lives.

The coverage area maps and detailed information can be **found here**.

Tropical Atlantic Active During 2010 But U.S. Landfalls Lacking

by Jim Hudgins

The 2010 Atlantic hurricane season was once again above normal in the number of storms with 16 named systems, (see image below), of which 9 became hurricanes, and 5 major hurricanes. There were also two tropical depressions that never reached storm status. The average number of storms is just around 10 named cyclones including 6 hurricanes and 3 majors (Category 3 +).

The first storm (Hurricane Alex) formed on June 25th and the last system (as of this writing) on October 12th which was Hurricane Paula, which dissipated October 15th. The strongest storm was Hurricane Igor, a category 4 hurricane with winds of 155 mph, which developed in the far eastern Atlantic as a classic Cape Verde type system. Igor made about a two week trek through the open Atlantic, eventually crossing Bermuda as a much weak category 1 system, before making a direct hit on Newfoundland. Earl was another Cape Verde system that reached category 4 status but again stayed mostly over open water before impacting Nova Scotia and Newfoundland. This system did bring battering surf and coastal flooding to parts of the Eastern U.S. but little impact to the local area. This trend was reflected through much of the tropical season with only the

Gulf Coast and Florida seeing landfalling weaker tropical systems while the East Coast remained basically untouched. This was due in part to a large trough of low pressure that persisted off the East Coast for much of the summer, which acted to deflect most storms offshore.

However, much of the region from Central America across the Yucatan Peninsula to mainland Mexico took the brunt of the landfalls, with strong winds and severe flooding causing destruction and loss of life. The total fatalities for the 2010 tropical season so far are around 250 with at least $7.9 billion in damage mainly outside of the U.S.

Climatology suggests that a few additional tropical systems could occur through the end of November, which marks the end of the official 2010 hurricane season.

The Heavy Rainfall Patterns of Winter

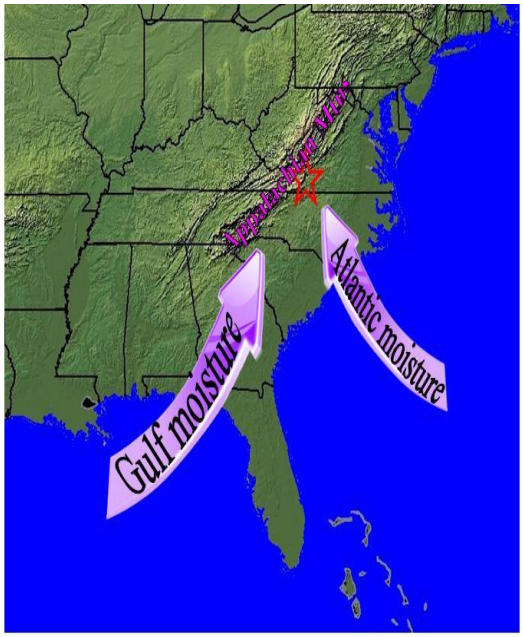
by Jan Jackson

The weather focus of winter is often on the threat of snow, sleet or freezing rain. However, flooding also remains a threat through the winter months. In fact, based on a local study, the majority of widespread areal floods, including river flooding, occur during the late cool season, from January through March. More importantly, the 3-month period from January through March also accounts for roughly half of all significant river flood events, 25 percent of all significant areal floods, and even 20 percent of all significant faster response flash floods.

Significant flooding is defined as causing considerable damage and/or posing a high threat to life and property. Some of the more memorable significant flood events for the area occurred during the cool season and were not associated with tropical systems, such as January 19, 1996, February 22, 2003, and November 19, 2003. Even the granddaddy of significant flood events for the area in recent memory was in the cool season- November 4, 1985.

High numbers of significant floods still occur in the winter months because vegetation is dormant and less evaporation allows soils to remain moist, so it takes less rainfall to produce runoff into creeks and streams. In addition, melting snow cover may add to the runoff. Since the area is located close to the moisture sources of the Gulf of Mexico and the Atlantic Ocean, storm

systems can sometimes tap into abundant moisture.



Pattern recognition is an important tool for early forecasts of heavy rainfall. Meteorologists look for weather patterns which have brought widespread heavy rainfall to the area in the past. A study of heavy rainfall events over the Blacksburg County Warning Area (CWA) during a 46 year period, (1964 – 2010), showed that there are basically 6 weather patterns which bring widespread heavy rainfall to the area during the cool season (September through April). One of those patterns- remnants of tropical storms, have their highest frequency in September, and then trail off through October, so do not affect the winter months. The following are brief descriptions of the other 5 heavy rainfall patterns of winter:

Upslope Flow- this pattern is characterized by a prolonged period of a southeast flow of moist unstable air into the Blue Ridge foothills and mountains.

The southeast flow is perpendicular to the mountains, and the moist air rises as it moves into higher terrain. This provides additional lift for shower, and sometimes thunderstorm development, while also focusing the heaviest rainfall right along the Blue Ridge. The upslope heavy rain pattern occurred most often in September and October, with 14 cases. The other 3 occurred in November, February and April.

This particular pattern has brought very heavy rainfall events to the Blue Ridge Mountains and foothills in the past, from the northern mountains and foothills of northwest North Carolina, northeast into southwest Virginia. The two 24 hour rainfall maps below from an October 7 - 8, 2005 event illustrate this well.

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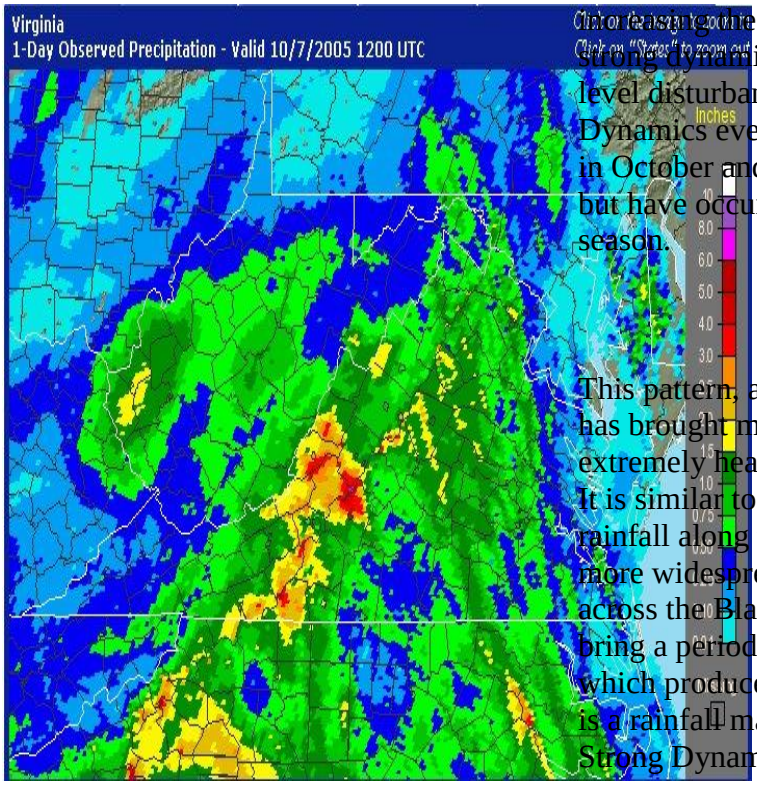
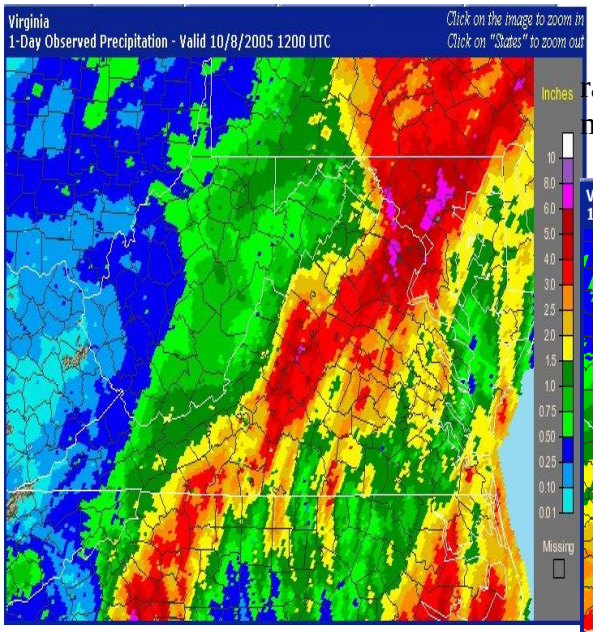


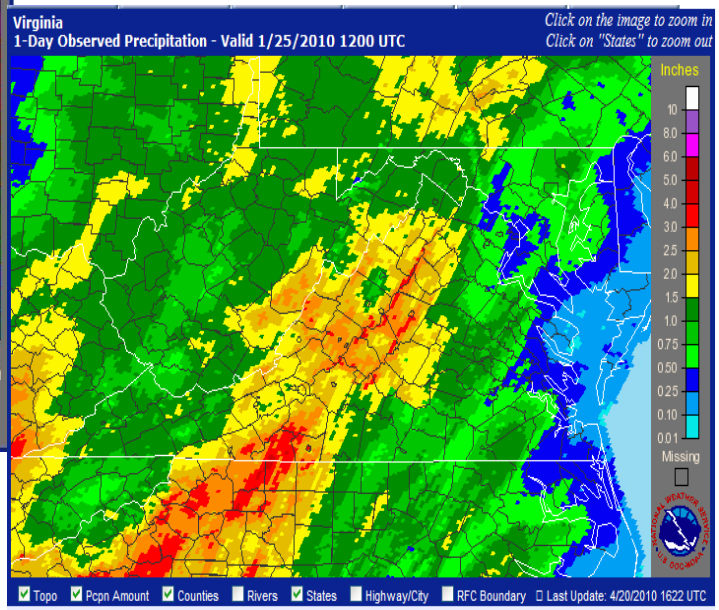
Click on image to zoom
Click on "States" to zoom out

rainfall intensity, but also has strong dynamical lift provided by an upper level disturbance. The Upslope Strong Dynamics events occurred most frequently in October and November, (7 of 15 events), but have occurred in every month of the cool season.

This pattern, along with tropical remnants, has brought most of the historically extremely heavy rainfall events to the area. It is similar to Upslope, with the heaviest rainfall along the Blue Ridge, but often has more widespread heavy rainfall amounts across the Blacksburg CWA, and can also bring a period of very high rainfall rates, which produces flash flooding. To the right is a rainfall map of a recent Upslope with Strong Dynamics heavy



rain event from January 24th into the early morning of January 25, 2010.



Upslope Flow with Strong Dynamics- This pattern is similar to the Upslope Flow pattern, with a southeast flow

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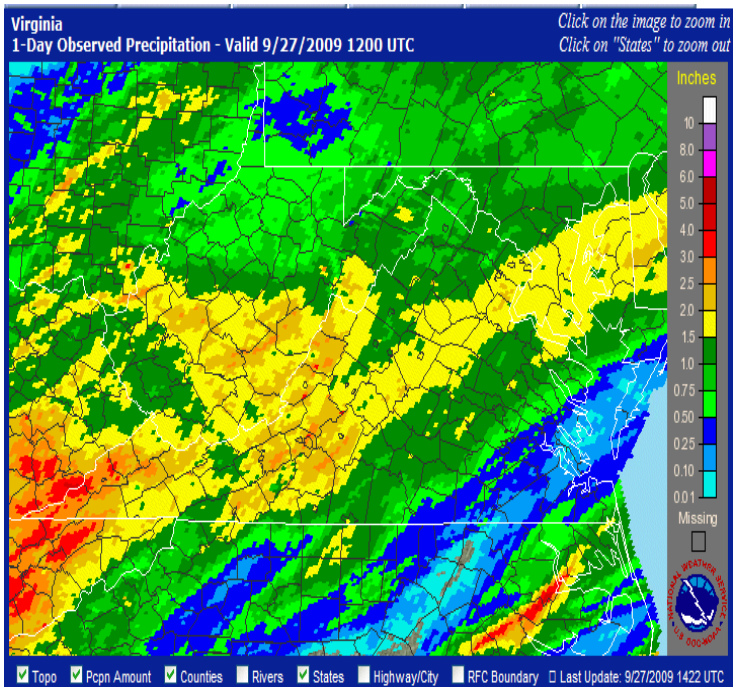
Cyclogenesis- in this pattern, heavy rainfall is generated by the strong vertical motion associated with a rapidly developing low pressure system. This is the same type of pattern than can bring heavy snowfall to the area in the winter, except that the high pressure prior to the event is centered off the Mid-Atlantic coast, and is pumping warm moist air into the Blacksburg CWA. In addition, the surface low tracks further north, generally directly over the Blacksburg CWA. Cyclogenesis heavy rain events occur mainly from December onward, (13 of 15 events), with a peak in March (6 events). The events have been rare in the recent past, with the last event identified in February 22, 2003. The heavy rainfall in this pattern is usually widespread, with the heaviest amounts varying along and south of the track of the surface low pressure.

Overrunning- in this pattern, the heavy rainfall is generated mainly from the strong vertical motion of very warm moist air rising over cooler air at the surface. It is similar to Cyclogenesis, except the surface high pressure is centered over the Great Lakes and northeast U.S. prior to the event, and a weaker surface low tracks out of the Gulf of Mexico and across the CWA. A warm front develops south of the Blacksburg CWA, and strong south winds bring plentiful moisture over the warm front, resulting in a cold rain. The events occurred in all months of the cool season, but the majority (8 of 12) occurred in February through April.

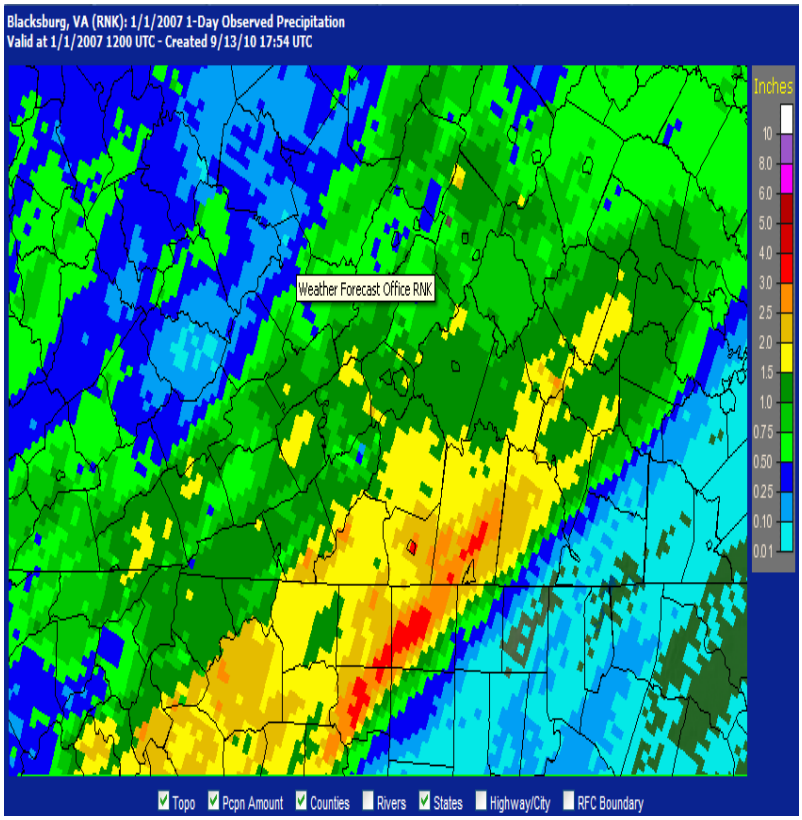
While heavy rain is generally widespread in the Overrunning events, the heaviest rainfall tends to develop in one or more bands oriented with, but north of, the warm front. The rainfall map to the right is from an event on January 26, 2009 illustrates this banding well.



Cold Frontal Passage- in this pattern, the heavy rainfall is generated from training thunderstorms along a slow moving cold front. Deepening low pressure moving northeast into the eastern Great Lakes brings a slow eastward progression of the cold front through the Blacksburg CWA. Meanwhile, high pressure off the Mid-Atlantic coast pumps deep moisture into the frontal boundary. The result is thunderstorms continuing to develop and moving northeastward along the slow moving front. This was the least common

heavy rain pattern in the study, with only 6 events.

Heavy rain in the Cold Frontal Passage events occurs in a band oriented with the cold front. Because the deeper Atlantic moisture is generally in the piedmont sections of Virginia and North Carolina, that is where the heavy rain bands tend to be located. The rainfall map to the right is from an event early on New Year's Day, 2007 shows the common locations of these heavy rain bands. This particular event caused a rapid rise on the Dan River, and significant flooding in Danville.



National Weather Service Blacksburg Says Goodbye to Two Employees

Brian Sutherland, Hydrometeorological Technician at Blacksburg, Virginia (RNK) retired on September 30, 2010 with a total of 43 years of government service, including 21 years with the National Weather Service.

Brian began his career with the United States Air Force in 1967 and plotted

weather maps for several years at European Weather Central in High Wycombe, England. In 1971, he was deployed for two years as a Weather Observer at McCoy Air Force Base in Orlando, Florida, and during the next couple of years served as a Weather Observer at Griffiss Air Force Base in Rome, New York, and at Sparrevohn Air Force Station in Alaska. In 1974, Brian was assigned to the USAREUR Tactical Forecast Unit in Heidelberg, Germany, where he continued to serve as a Weather Observer. In 1978, he relocated to K. I. Sawyer Air Force Base in Gwinn, Michigan and served for the next three years as a Weather Forecaster. From 1981 through 1984, he served as a MAC Technical Advisor for the 201st Weather Flight Air National Guard Unit at Suffolk County Air Force Base in New York; and served from 1984 through 1988 as a Weather Forecaster for the Alaska Forecast Unit stationed at Elmendorf Air Force Base in Anchorage, Alaska. From 1988 into 1989, Brian attended Flight Service School at the FAA Academy in Oklahoma City, Oklahoma.

Brian began his career with the NWS in 1989, when he was selected as a Meteorological Technician at Saint Paul Island, Alaska. In 1991, he relocated to Volens, Virginia, where he served as a Meteorological Technician and WSR-74S radar operator. In 1992, he headed back to Anchorage, Alaska, as a Meteorological Technician. A couple of years later, he was hired to serve as a Meteorological Technician at the Weather Service Office in Lynchburg, Virginia; and in 1995, reported for duty as a Hydrometeorological Technician at the spin-up WFO in Blacksburg, Virginia. He dutifully served at the Blacksburg WFO until his retirement in late September, 2010.

He has plans to continue with his hobbies of photography, cars, and cool-season meteorology. We wish Brian all the best in his upcoming retirement. He will be greatly missed - both personally and professionally.

Robyn Brown, General Forecaster at Blacksburg, Virginia (RNK) left the National Weather Service (NWS) on September 26, 2010 after providing over six years of full-time government service. Robyn began her service with the NWS by serving as a student volunteer from 2002 through 2003. In 2004, she was hired as a part-time employee under the competitive Student Career Experience Program (SCEP), which requires the student to satisfy at least 640 hours of service prior to college graduation. Mrs. Brown received her B.S. degree in Atmospheric Science from UNC-Asheville in May 2005, and was subsequently hired as a Meteorologist Intern at the NWS office in Charleston, South Carolina in June 2005. In September 2009, Robyn was promoted to a General Forecaster position at the NWS office in Blacksburg, Virginia, where she has dutifully served since that time. We wish Robyn all the best in whatever the future may hold for her. She has been a tremendous asset to the office, and she will be greatly missed - both personally and professionally.

WEATHER FOLKLORE AND SAYINGS

by James White

Weather folklore is often dismissed as nothing more than a grab bag of sayings, old wives' tales, legends, and superstitions. In other words, folklore is considered the opposite of science. But folklore and science have more in common than you might imagine. What we call scientific method is based on observation and evidence - and so is a great deal of weather folklore.

Some fall/winter sayings include:

When leaves fall early, autumn and winter will be mild; when leave fall later, winter will be severe.

Flowers blooming in late autumn are a sign of a bad winter.

A warm November is the sign of a bad winter.

Thunder in the fall foretells a cold winter.

Other folklore explained:

CRICKETS CHIRP FASTER WHEN IT'S WARM AND SLOWER WHEN IT'S COLD.

Crickets can indeed serve as thermometers. Tradition says that if you count the cricket's chirps for 14 seconds and then add 40, you will obtain the temperature in Fahrenheit at the cricket's location.

MARCH COMES IN LIKE A LION AND GOES OUT LIKE A LAMB.

This well known saying is derived from the observation that March begins in winter and ends in spring. In northern latitudes, temperatures are generally higher by the end of the month than during its first weeks. We may also look to the heavens to determine an explanation, the constellation of Leo, the lion, dominates the skies at the beginning of the month and the constellation Aries, the ram or lamb, prevails as the month winds down.

NO WEATHER IS ILL, IF THE WIND IS STILL

Calm conditions, especially with clear skies, indicate the dominance of a high-pressure system. When they are absent or weak, precipitation and cloud formation are much less likely. But let's not forget the saying "the calm before the storm". Thunderstorms frequently develop in environments where winds are low. Calm conditions can also occur on very cold days with clear skies. People shivering with the cold, might not think that a still wind bodes no ill.

WHEN WINDOWS WON'T OPEN, AND THE SALT CLOGS THE SHAKER, THE WEATHER WILL FAVOR THE UMBRELLA MAKER!

Windows with wood frames tend to stick when the air is full of moisture. The moisture swells the wood, making windows and doors more difficult to budge. By the same token, salt is very effective at absorbing moisture, so it clumps together

rather than pouring out. As moisture collects in the air, there is a greater likelihood of precipitation.

WHEN A HALO RINGS THE MOON OR SUN, RAIN'S APPROACHING ON THE RUN.

A halo appears around the moon or the sun when ice crystals at high altitudes refract the moonlight (or sunlight). That is a good indication that moisture is descending to lower altitudes, where it is likely to take the form of precipitation. A halo is a more reliable indicator of storms in warmer months than during winter months.

SHARP HORNS ON THE MOON THREATEN BAD WEATHER.

The moon in this instance is supposed to predict precipitation because it is perceived as being in the shape of a bowl, which means that it is filling with water or snow. If it's "horns" are tipped to the side, some people believe that precipitation will descend.

WHEN THE SUN DRAWS WATER, STORMS WILL FOLLOW.

The sun does not draw water. This saying describes an optical illusion in which the sun's rays alternate with bands of shadow to produce a fanlike effect. Those shadowy patches are dense clouds, some of which are thin enough to allow sunlight to reach earth. However, the saying is not without merit. If the sun is obscured in the west, it means that moisture-laden clouds have gathered there, and it's quite possible that rain will follow if the temperature is favorable for the condensation of that moisture.

LIGHTNING NEVER STRIKES THE SAME PLACE TWICE.

This is one of the most famous weather sayings – and it's wrong. Lightning not only can strike the same place twice, but it seems to prefer high locations. New York City's Empire State Building, for example, is struck about 25 times every year.

TORNADOES DON'T HAPPEN IN THE MOUNTAINS.

Tornadoes do occur in the mountains. Damage from a tornado has been reported above 10,000 feet. Tornadoes have barreled across mountain chains including the Appalachians, the Rockies, and the Sierra Nevada. In 1987, an especially violent tornado crossed the Continental Divide in Yellowstone National Park.